

REMARKS

Claims 1-20 are pending in this application. Claims 1, 7, 10 and 19 have been amended by the present Amendment. Amended claims 1, 7, 10 and 19 do not introduce any new subject matter.

AMENDMENTS TO CORRECT TYPOGRAPHICAL ERRORS

In reviewing the claims, Applicants noticed some inadvertent typographical errors, which Applicants have attended to correcting with the above amendments to claims 7, 10 and 19. No new matter is added by the amendments.

REJECTIONS UNDER 35 U.S.C. § 102

Reconsideration is respectfully requested of the rejection of claims 1, 6-7 and 17 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,750,469 ("Ichihara").

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the . . . claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); M.P.E.P. § 2131.

Applicants respectfully submit that Ichihara does not disclose or suggest (1) a second semiconductor region electrically connected to the phase-changeable film, defined within a second active region and separated from the first semiconductor region by an isolation layer, as recited in amended claim 1; (2) a phase-changeable film shared by the plurality of access transistors, as recited in original claim 7; and (3) a

component area comprising a plurality of phase-changeable films, wherein at least one phase-changeable film is electrically connected to an adjacent semiconductor region of an adjacent component area, as recited in original claim 17.

Claim 1

Ichihara fails to disclose first and second semiconductor regions electrically connected to the phase-changeable film, which are separated from each other by an isolation layer, as recited in amended claim 1. The Examiner maintains that areas 13 and 14 shown in Fig. 2 represent first and second semiconductor regions. However, as shown and described in Ichihara, areas 13 and 14 are not separated from each other, but instead are stacked on each other. See Ichihara Fig. 2 and col. 11, lines 26-29. Therefore, in contrast to the embodiment recited in claim 1, areas 13 and 14, which are stacked on top of each other, cannot possibly be separated from each other by an isolation layer. See, e.g., Applicants' disclosure, page 14, lines 2-6 and Figs. 8B and 10 (reference FOX).

As such, Applicants respectfully submit that claim 1 is not anticipated by Ichihara and is in condition for allowance. Further, Applicants respectfully submit that for at least the reason that claim 6 depends from claim 1, claim 6 is also not anticipated by Ichihara.

Claim 7

Ichihara fails to disclose a phase-changeable film shared by the plurality of access transistors, as recited in claim 7.

In contrast to the embodiment recited in claim 7, Ichihara shows a memory cell consisting of a single transistor 30 and a phase change storage cell 1. See Ichihara,

Fig. 1B and col. 11, lines 4-8. Further, Ichihara shows a phase change storage cell 1, which includes a phase change storage layer 16 electrically isolated by a second insulation channel 21. See Ichihara, Fig. 2 and col. 11, lines 33-34. Therefore, the phase change storage layer disclosed in Ichihara is only connected to one transistor and since it is electrically isolated, the phase-change storage layer is clearly not shared by a plurality of transistors. See, e.g., Applicants' disclosure, Figs. 5, 8B and 10 and page 13, lines 5-8 and page 14, lines 7-8.

As such, Applicants respectfully submit that claim 7 is not anticipated by Ichihara and is in condition for allowance.

Claim 17

Ichihara fails to disclose (1) a component area having a semiconductor region electrically connected to a plurality of phase-changeable films; and (2) at least one phase-changeable film of the plurality of phase changeable films that is electrically connected to an adjacent semiconductor region of an adjacent component area, as recited in original claim 17.

As stated above, each memory cell in Ichihara consists of a phase change storage cell 1, which includes one phase change storage layer 16 electrically isolated by a second insulation channel 21. See Ichihara, Fig. 2 and col. 11, lines 33-34. However, unlike the memory cell shown in Ichihara, each component area recited in claim 17 (see, e.g., component area TC01 in Fig. 16) includes a plurality of phase-changeable films (e.g., GST0 and GST12). Further, in contrast to the phase change storage layer of Ichihara, which is electrically isolated from an adjacent memory cell, at least one phase-changeable film recited in claim 17 is electrically connected to a semiconductor

region of an adjacent component area. See, e.g., Fig. 16 (reference GST12 connected to a semiconductor region in adjacent component area TC23).

As such, Applicants respectfully submit that claim 17 is not anticipated by Ichihara and is in condition for allowance.

Therefore, for at least the above reasons, Applicants respectfully submit that claims 1, 7, and 17 are not anticipated by Ichihara. In addition, for at least the reason that claim 6 depends from claim 1, claim 6 is also not anticipated by the cited reference.

As such, Applicants respectfully request that the Examiner withdraw the rejection of claims 1, 6-7 and 17 under 35 U.S.C. § 102(e).

REJECTIONS UNDER 35 U.S.C. § 103(a)

Reconsideration is respectfully requested of the rejection of claims 4-5, 8-16 and 18-20 under 35 U.S.C. § 103(a) as being unpatentable over Ichihara in view of the remark.

Claims 4-5, 8-16 and 18-20 Are Patentable Over Ichihara At Least By Virtue Of Their Dependency On Claims 1, 7 and 17

Applicants respectfully submit that claims 1, 7 and 17 are patentable over Ichihara. As stated above, Applicants respectfully submit that Ichihara does not disclose or suggest (1) a second semiconductor region electrically connected to the phase-changeable film, defined within a second active region and separated from the first semiconductor region by an isolation layer, as recited in amended claim 1; (2) a phase-changeable film shared by the plurality of access transistors, as recited in original claim 7; and (3) a component area comprising a plurality of phase-changeable films, wherein at least one phase-changeable film is electrically connected to an adjacent semiconductor region of an adjacent component area, as recited in original

claim 17. It would not have been obvious to modify Ichihara to include these features.

As such, Applicants respectfully submit that claims 1, 7 and 17 are patentable over Ichihara. For at least the reason that claims 4-5, 8-16 and 18-20 depend from claims 1, 7, and 17, respectively, claims 4-5, 8-16 and 18-20 are also submitted to be patentable over Ichihara.

The Examiner Has Failed To Establish A Prima Facie Case
Of Obviousness With Respect To Claims 4-5, 8-16 and 18-20

The Examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. See In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); M.P.E.P. § 2142. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

With respect to claims 4 and 5, the Examiner argues that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a plurality of third conductive lines that are ground lines." However, the Examiner has not explained why Ichihara would have fairly suggested, to one of ordinary skill in the art, the use of the third conductive lines, nor has the Examiner provided any convincing line of reasoning for the obviousness determination.

Similarly, with respect to claims 8-16 and 18-20, the Examiner merely restates the claim language and states that Ichihara discloses the claim elements. The Examiner generally points to col. 11, lines 4-65 and Figs. 1B and 2 of Ichihara as

disclosing the claim elements, but omits any discussion linking the cited passages to the claim elements.

A review of the cited sections of Ichihara reveals that Ichihara, at the very least, does not appear to disclose or suggest the following limitations recited in claims 8-16 and 18-20: (1) the phase-changeable film connected to multiple drain regions through at least one of a plurality of electrodes (the reference only discloses one transistor 30 in connection with each phase change storage cell 1 and there is no discussion concerning multiple drain regions); (2) a plurality of access transistors sharing an electrode (Ichihara does not discuss this configuration); (3) a source region of each access transistor connected to a respective ground line (as admitted by the Examiner, ground lines or the configuration thereof are not discussed in Ichihara); (4) drain and source regions of each access transistor defined within an active region (Ichihara only generally discusses a drain and source as being part of a transistor); (5) an active region divided into a plurality of regions isolated from each other (see above argument with respect to separated semiconductor regions in claim 1); (6) a source region of each access transistor commonly connected to a ground line, wherein the ground line is shared by the source region of each access transistor (Ichihara only generally discusses a drain and source as being part of a transistor and as admitted by the Examiner, ground lines or the configuration thereof are not discussed in Ichihara); (7) a plurality of access transistors sharing a source region (Ichihara only generally discusses a drain and source as being part of a transistor and does not address sharing of a source region by a plurality of transistors); (8) a phase-changeable film connected to a bitline through a bitline contact shared by the drain region of each access transistor

(Ichihara only generally discusses a drain and source as being part of a transistor and does not address sharing of a bitline contact by multiple drain regions); (8) at least one bitline contact of a plurality of bitline contacts connecting at least one phase-changeable film to an adjacent semiconductor region (as argued with respect to claim 17, the phase change storage layer of Ichihara is electrically isolated from an adjacent memory cell); (9) twisted conductive lines (Ichihara does not address twisting of conductive lines); and (10) a third conductive line which is a ground line (as admitted by the Examiner, ground lines are not disclosed in Ichihara).

Applicants respectfully submit that the Examiner's reasoning in support of the obviousness rejections is based almost entirely on speculation and conjecture and relies on Applicants' disclosure and teachings to supply that which the cited reference lacks.

Accordingly, for at least the above reasons Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness of claims 4-5, 8-16 and 18-20.

Therefore, Applicants respectfully submit that claims 4-5, 8-16 and 18-20 are patentable over Ichihara, when taken alone, or in combination with the Examiner's remarks.

As such, Applicants respectfully request that the Examiner withdraw the rejection of claims 4-5, 8-16 and 18-20 under 35 U.S.C. § 103(a).

CLAIMS 2-3

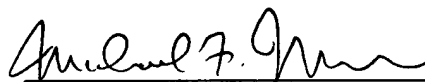
In the January 7, 2005 Office Action, the Examiner has not provided any explanation for the rejection of claims 2-3. The Examiner has failed to specify a

rejection under any applicable section of the U.S. Code for these claims. Further, if the Examiner intended to reject claims 2-3 for want of novelty or for obviousness, the Examiner should have at least: (1) specified each rejected claim in connection with the applicable section on which the rejection was based (i.e., 102 or 103); (2) cited the best references at the Examiner's command; and (3) explained the pertinence of each reference. See 37 C.F.R. § 1.104.

Therefore, Applicants respectfully submit that claims 2-3 are in condition for allowance.

An early and favorable reconsideration is earnestly solicited. If the Examiner has any further questions or comments, the Examiner may telephone Applicants' Attorney to reach a prompt disposition of this application.

Respectfully submitted,



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